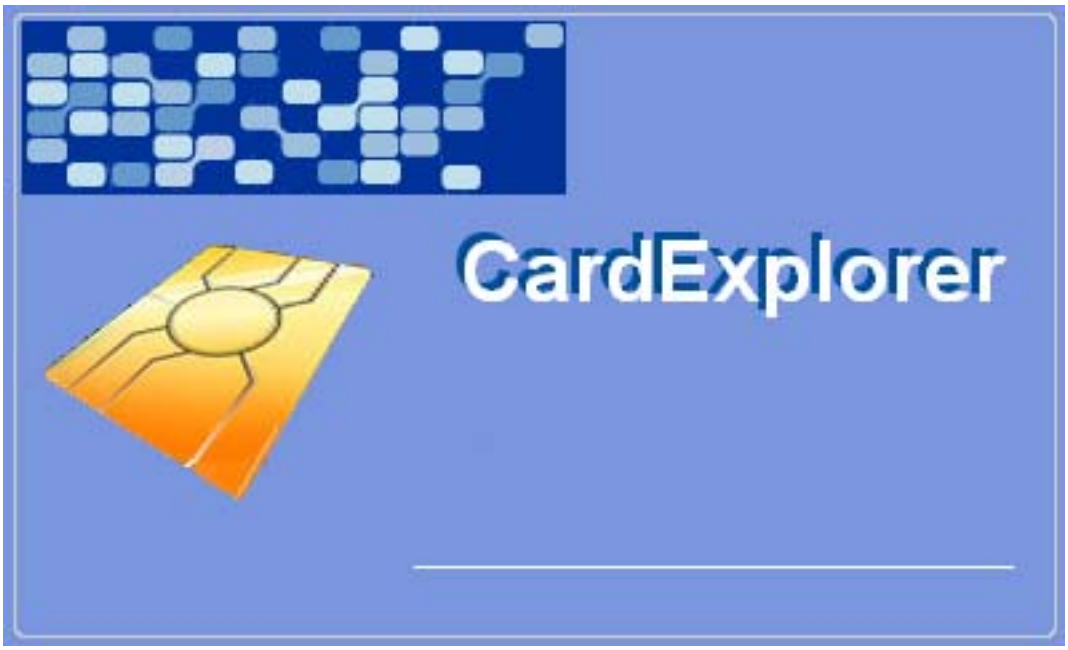

User Manual

- English –

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1. Introduction.

Duolabs is proud to bring you CardExplorer 1.5.
Duolabs è lieta di potervi presentare il CardExplorer 1.5.

CardExplorer is a powerful software tool which allows dialogue with a Smartcard in ISO 7816-4 format that is intuitively simple and easy to use.

CardExplorer has been designed to function with programmers such as Phoenix/Smartmouse at 3,579/3,68/6,000 Mhz or programmers such as Dynamite or Cas Interface 2 with Add-on.

CardExplorer makes it possible to send single commands or command sequences (scripted in Visual Basic) directly to the Smartcard in order to analyse the various responses.

Apart from the functions described below, CardExplorer has also been designed to be able to analyse traffic between a SmartCard and a remote device. This function, called the “Logger” is even able to analyse traffic at speeds other than 9600 or multiples (19200, 38400, 57600 etc), making it a more powerful tool than most others on the market. This tool is supported only for use with Dynamite programmers and Cas Iterface 2 programmers with its Add-On in that they possess a clock generator which is able to support frequencies at different Baud-Rate than the standard.

2. General Notes

This software has been created for educational purposes and this manual does not contain any procedures for the SmartCard's alteration or modification, partial or complete. Duolabs SRL does not accept any resposibility in case of improper use of this software, nor of any eventual damage caused by mishandling by any third party.

This software is freeware and may be distributed as such, but in no way must it be sold.

This software must not be disassembled, not even in part.

Duolabs SRL does not offer any guaruntee in regard to the functioning of this software and does not assume any responsibility in case of failure or erroneous function, nor does it assume responsibility for any eventual damage caused by the user or by any third party.

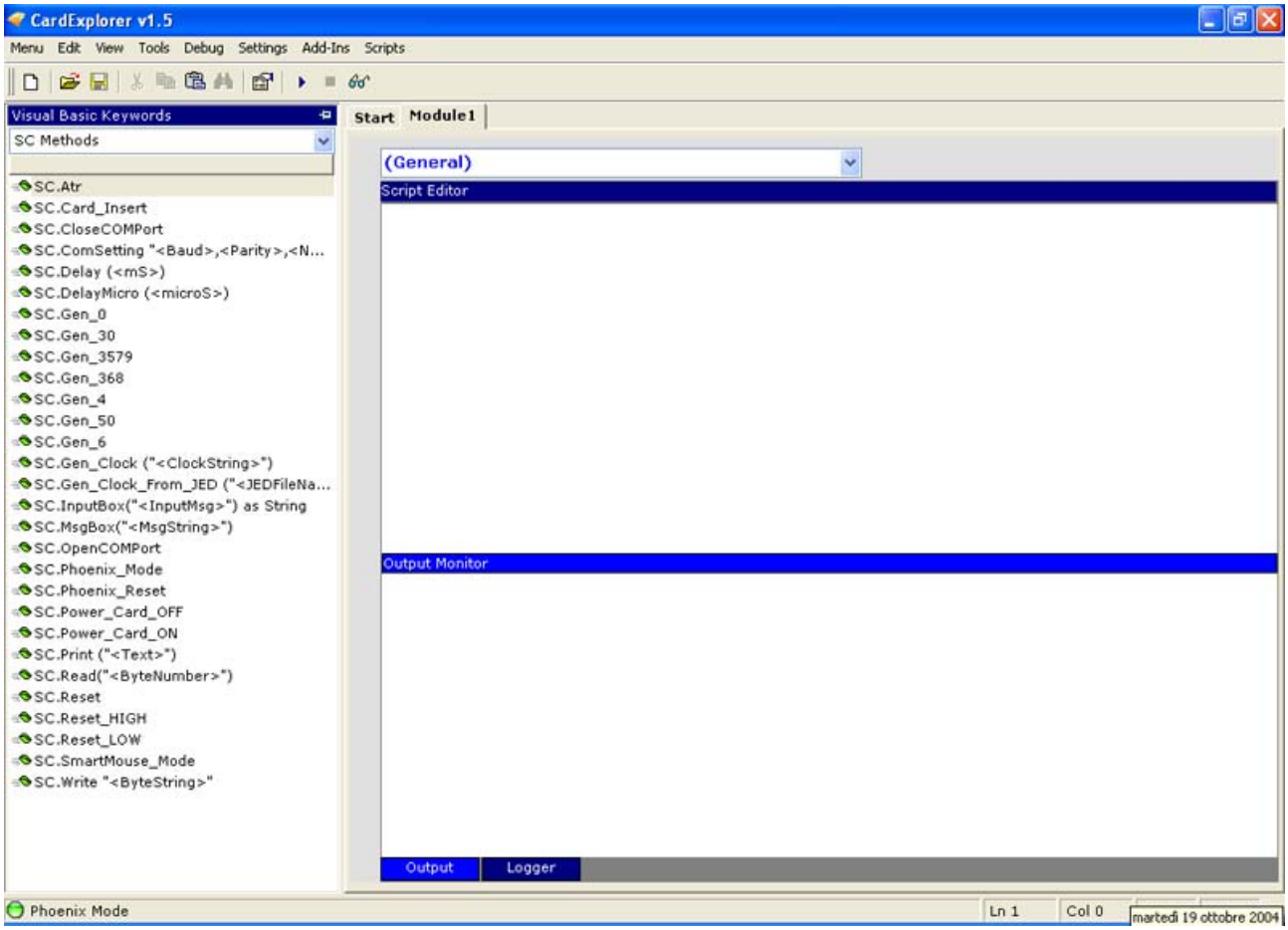
No person or party has the right to demand the resolution of any eventual technical problems as this product is distributed "As is" and ***does not carry any obligation to technical support from the part of our technical personnel.***

Any comments, suggestions or bug reports can be sent to the following email address: support@duolabs.com

Duolabs SRL reserves the right to take legal action against any party who may be found to be in violation of any of the above.

3. How to start.

Having started the software, the first screen that will be displayed is the following window (fig.1)



(Fig.1)

At this point at the bottom left of the screen the relevant programmer should be displayed.
If the software fails to detect any programmer, the words “Phoenix Mode” will be displayed as in the above image.
If a Dynamite or Cas Interface 2 with Add-On is connected, its name will be displayed.
As some functions are available only with the programmers above, we strongly recommend that you insure that they are connected correctly and their drivers installed.
Instructions to this end can be found on the website www.duolabs.com.

The window.

The following is an an analysis of the window which is currently on screen.
At the left we have the **"Visual Basic Keywords"** window, which displays all the Visual Basic (explained below) relative to the script. The drop-down menu will initially show "*SC Methods*". Clicking on the arrow to the right of the drop-down menu will display all other available options.

The central upper window, entitled **"Script Editor"** contains the script if the commands to send to the SmartCard. The execution of the script upon launch is relative to the contents of this window.

The central lower windows, entitled **"Output Monitor"** or **"Output Logger"** is selected (displayed in the colour blue) depending on the output. After the execution of the commands displayed in the **"Script Editor"** (above) the results are displayed in this window.
The window **"Output Monitor"** will only display results of the script's execution or of single commands.
The window **"Output Logger"** will display the traffic between the SmartCard and the software only if it is active during the execution of the script. It is allowed to take a log in certain instants only and not display all the traffic as with the other window indicated above. To be able to activate this function and observe the results in the **"Output Logger"** window, it will be nevessary to use various commands contained in the **"Logger Method"** menu, which is explained in detail below.

The Control Menu.

The control menu can be found at the very top of the screen. The various items in the menus and sub-menus are described below.

Menu
Functions relative to files.

- New – Allows the user to open a new project.
- *** - Name of the project.
- Open File – Allows the user to open a previously saved project.
- Save As – Allows the user to save the current project.
- Recent – Loads recent files.
- Exit – Exit from the programme.

Edit
Functions relative to the editing of text.

- Copy – Copies the selected contents to the Clipboard.
- Paste – Inserts the contents of the Clipboard.
- Cut – Copies the selected contents to the Clipboard and cacels them from their current position automatically.
- Select All – Selects all the text.
- Find Text – Searches for a word or text.
- Replace Text – Finds and replaces text.
- Indent – moves the text in the phase of being written to the right.
- Outdent – moves the text in the phase of being written to the left.

View
Functions realtive to using the window to the left shown in fig.1 such as "Visual Basic Keywords".

- *** Properties – Properties of the project.
- Keywords – Displays the Keywords for scripting and various commands relative to the Visual Basic script.
- Symbols – Displays all ASCII symbols.

Tools.
Functions relative to writing Visual Basic code to accelerate the writing process.

- Add Cons – Declare Public, Private, Global, None (locale) constants.
- Add Procedure – Add a Visual Basic Procedure.
- Wizard – Add automatically an If Then Else statement or function.

Debug.

Allows the user to search for errors in a Visual Basic script or a simple command within the "Script Editor" window.

- Run – Launch (start) a script or a series of commands found in the "Script Editor" window.
- Clear Output Logger – Delete all contents in the Output Logger.
- Clear Output Monitor – Delete all contents in the Output Monitor.

Settings.

In this menu the user can set the parameters for using the programmer. The following settings are possible.

- *Receive Timeout* – Is the longest waiting time for a response from the SmartCard express in milliseconds.
- *Reset Option* – If **"No Reset"** is selected the reset function is not performed upon the execution of the script. If **"ISO Reset"** is selected the reset function will be performed before the execution of the script, or commands, real or personal.
- *Reset after Timeout* – If selected, the Smartcard will be sent a reset upon the recieval of a timeout from the Smartcard.

- *Use Dynamite or Cas Interface 2 and Add-On.* – The following parameters can only be configured by owners of Cas Interface 2 with Add-On or Dynamite. There are two sub-menus:

  - **"Comunicate using USB" –** Allowes the use of Dynamite or Cas Interface 2 with Add-On using a USB port. The availablr sub-functions are:

    - **Type Programmer:** Phoenix or Smartmouse. Tjos function identifies the type of reset.
    - **Clock Frequency:** Selects the used frequency 3,579/3,68/4,00/6,00/30,00/50,00/Define from Jed file. This last option, "Define from Jed file", allows the user to load a predefined frequency using the results (file with .JED extension) using the CyberClocks software (freeware from www.cypress.com). The option to use is "RT for CY22150".

  - **"Comunicate using COM" –**

    - **Type Programmer:** Phoenix or Smartmouse. Tjos function identifies the type of reset.
    - **Clock Frequency:** Select the frequency used 3,579/3,68/4,00/6,00/30,00/50,00.
    - **Com Port:** Select the parameters of the COM port, such as the number of the COM port, the speed

(Baud-Rate), Parity, Data Bit and Stop Bit.

- *Use Phoenix Smartmouse* – The following parameters are only able to be configured by owners of Phoenix &/or Smartmouse programmers. Here it is only possible to configure settings relative to the COM port; the port's identifying number, the speed (Baud-Rate), Parity, Data Bit and Stop Bit.

Add-Ins

In this menu the parameters for using the programmer in the phase of "logging" can be set.

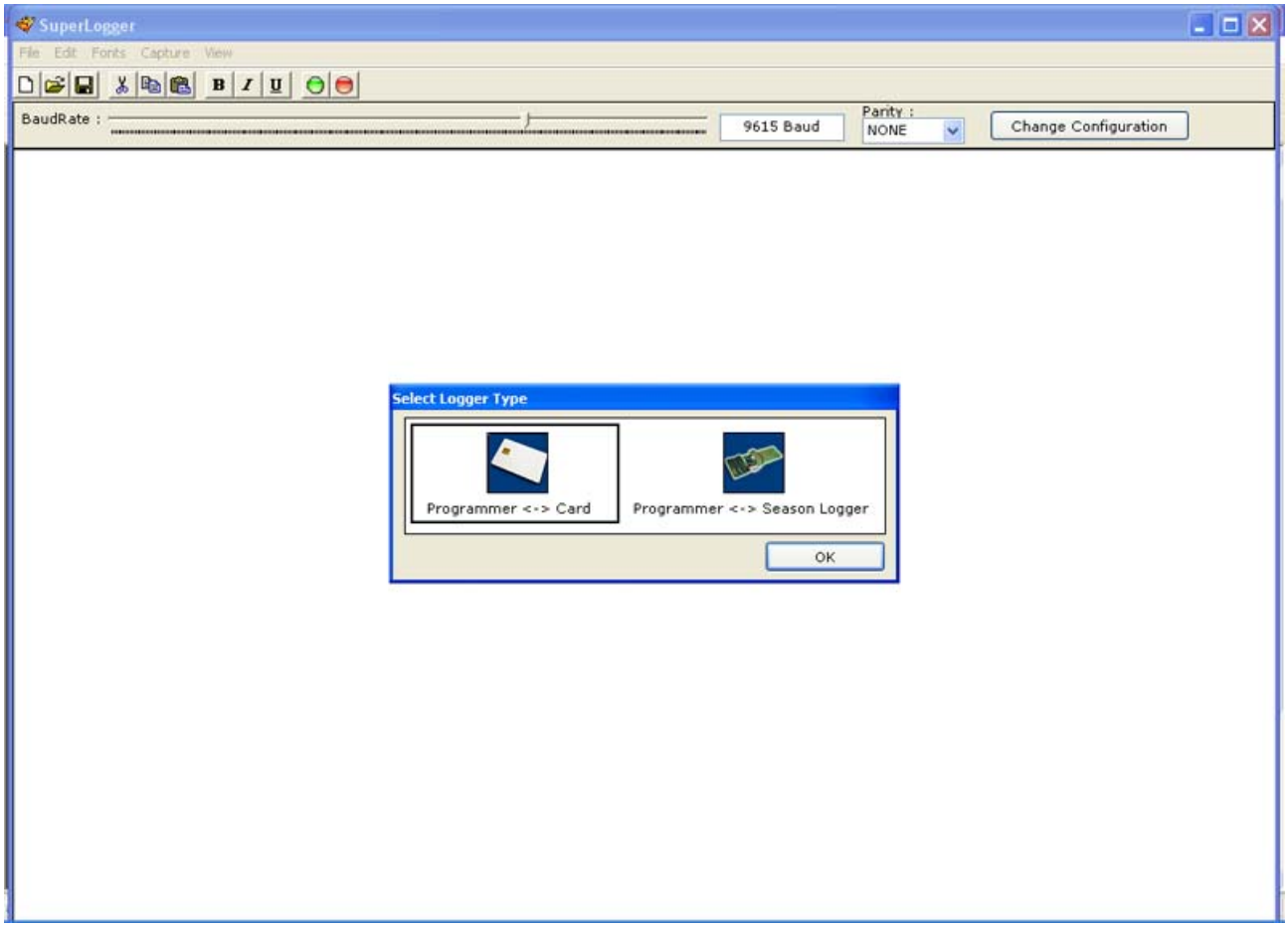
o *Logger table* – Selecting this operation allows the user, using the scroll-bar, to calculate the value, indicated as a parameter in the logger function, correspondent to a determinate Baud-Rate of communication between the Smartcard and the remote system. The user must indicate the number that will appear to the left of the Baud-Rate in the function:

Logger.SelectLoggerBaudRate(<Value As Byte>)

where “Value” is the value that is determined. This function is contained in **"Logger Methods”** and functions only with Dynamite or Cas Interface 2 with Add-On programmers.

o *Super Logger* – This function allows the user to open the Super logger menu. To be able to access this function it is neccessary to use a Dynamite or Cas Interface 2 with Add-On programmer.
Ensuring that the programmer is connected, click Super Logger.

The following screen will be displayed (fig.2):



(fig.2)

The user will be presented with two options. Programmer <–> Card or Programmer <–> Season Logger. These two options are explained below:

1. *Superlogger - Programmer <–> Card.*

   This function allows the user to log, via a USB port, the traffic passing between a Smartcard and the PC. The user is reminded that the log is able to be used only for traffic passing over the COM port of Dynamite or Cas Interface 2 with Add-On programmers. It is not possible with this function to log traffic of the USB port.
   To activate this function select the icon Programmer <-> Card and click "OK".

   The following is a detailed explanation of the itial screen with its various functions.

   The drop down menus (file management, editing, fonts etc) do not give themselves to excess explanation as they follow their traditional meanings in windows programmes. *"Capture"* however, is something of a novelty, and is explained below*:*

   - *"Capture Start"* applies the same function as the green icon in the control bar un the control menu. A user who activates the *"Capture*

Start" function will be asked to set the clock and mode (Phoenix or smartmouse). To initialise "logging " it will be sufficient to confirm these settings.

- *"Capture Stop"* stops the Capture.
- *"Capture Filter"* allows the user, once a sepcified string has been recieved, to go the starting line of the Sub.

Baud-Rate Bar

The Baud-Rate bar allows the user to set the Baud-Rate and parity. Once changes have been made it will be necessary to click "Change Configuration".

2. *Superlogger - Programmer <–> Season Logger.*

This function allows the user, using a Season Logger, to log the traffic passing between a Smartcard and a remote device. It is sufficient to use a PIN to PIN serial cable ***connected only Massa-GND (pin 5) and RX (Pin 2) to the Com port*** of Dynamite or Cas Interface 2 with Add-On and set the Baud-Rate that is to be logged. This function is very important in that in many cases it is not possible to log passing traffic because the serial port of the PC can't be set to a prestabilised Baud-Rate.

Thanks to this specially developed function it will be possible to log (knowing the correct Baud-Rate) any traffic passing from a Smartcard and a remote device, independantly from the speed of the communication.

Scripts.

The Scripts menu allows the user to load preprepared scripts. Those scripts are held in the file Myscrpits.dat in the main directory that file can be modified by modifying the file string in the following simple way:

[Name of the Script]\Directory*.dsf

es.
[ATR]\Script\ATR.dsf
[Logger]\Script\Logger.dsf

The two prefabricated scripts are relative to ATR.

Other scripts are present in the Script directory.

4. Commands and syntax.

In the case that the user would like to send a single or command or a series of single commands directly to the Smartcard, without using any script, the process is very simple.

It is sufficient to send a reset to the smartcard using the appropriate function in the Instrument Bar and upon the recieval of this reset it is possible to send commands to the Smartcard. To send a command the user must type the following syntax.

CLA INS P1 P2 LEN
RXX – XX reppresents the length of the Byte to recieve in the response.

Eg

A0 A4 00 00 02
R02 The expected reponse will have a bit-length of 2.

This procedure is very simpèle and similar to most other software in the sending of commands.

Script and descriptions of the functionality of the Scripts.

SC Methods.

SC.Atr – Performs the reset function of the Smartcard and displays the ATR of the Smartcard.

SC.Card_Insert – Boodlean function (True/False) which is used to indicate if the Smartcard is inserted in the reader or not.

SC.CloseCOMPort – Close the COM port in use.

SC.ComSetting "<Baud>,<Parity>,<NumByte>,<StopByte>" - Define the settings of the COM port.

Eg. SC.ComSetting "9600,e,8,2"

SC.Delay (<mS>) – Set a waiting time between each command, defined in milliseconds.

SC.DelayMicro (<microS>) - Set a waiting time between each command, defined in microseconds.

SC.Gen_0 – Stop the clock.

SC.Gen_30 - Generate the clock at 30,00 Mhz
SC.Gen_3579 - Generate the clock at 3,579 Mhz
SC.Gen_368 - Generate the clock at 3,68 Mhz
SC.Gen_4 - Generate the clock at 4,00 Mhz
SC.Gen_50 - Generate the clock at 50,00 Mhz
SC.Gen_6 - Generate the clock at 6,00 Mhz

* clearly the frquencies must be supported by the programmer in question. This is not a problem if a Dynamite or Cas Interface 2 with Add-On programmer is being used.

SC.Gen_Clock ("<ClockString>") – Funzione non descritta usare la funzione seguente ***SC.Gen_Clock_From_JED ("<JEDFileName>")***.

SC.Gen_Clock_From_JED ("<JEDFileName>") - Program the clock to using a JEDEC file generated by CyberClocks.

SC.InputBox("<InputMsg>") As String - Ask for data input from the user.

SC.MsgBox("<MsgString>") - Programme a message box to appear as a window.

SC.OpenCOMPort - Boodlean function which opes the COM port specified by the "SC.CommPort" property. Returns *True* if it is open or *False* if it is already occupied by another program.

SC.Phoenix_Mode - Set the programmer to Phoenix mode.

SC.Phoenix_Reset - Function that sends a resent to the card without a response. The difference between this and ***"SC.Atr"*** is that this command does not display any returned ATR value.

SC.Power_Card_OFF - Suspends power from the card.

SC.Power_Card_ON - Opens power-feed to the card.

SC.Print ("<Text>") - Function that allows the user to write a message in the Output Monitor window during the execution of a script.

SC.Read("<ByteNumber>") - Reads *n* bytes, expressed in Hex.

SC.Reset - Function that sends a resent to the card without a response. The difference between this and ***"SC.Atr"*** is that this command does not display any returned ATR value.

SC.Reset_HIGH - Function that sets the pin of reset of the card to "high"

SC.Reset_LOW - Function that sets the pin of reset of the card to "low"

SC.SmartMouse_Mode - Function that sets the programmer to Smartmouse

mode.

SC.Write "<ByteString>" - Function that allows the user to send a string of bytes to the card.

Eg. Sc.Write("AA BB CC")

SC Properties.

SC.COMPort= <COMNumber> - Defines the number of the COM serial port to be used.

SC.Connection = <0=USB-1=COM> - Properties that identify the connection to be used.

** This property is set and remains set until it is reset.

Eg.

```
SC.Connection = 0     ' Selecting the USB connection
SC.Atr                ' Requesting the ATR of the card via USB
SC.Connection = 1     ' Selecting the COM connection
SC.Atr                ' Requesting the ATR of the card via COM
```

SC.ReceiveTimeOut = <TimeOut ms> - Defines the time for a TimeOut on a response from the card.

SC.ResetCOMDirection = <0=Direct-1=Inverse> - Defines the direction of the Reset.

Logger Methods.

These functions are used only when using a Dynamite or Cas Interface 2 with Add-On.

Logger.SelectLoggerBaudRate(<Value As Byte>) – Select

Logger.Start_Logger – Initialise "logging" of traffic passing between the Smartcard and the programmer or the remote device.

Logger.Stop_Logger - Stops "logging" of the passing traffic.

These results are displayed in the "Logger Monitor" window.

Logger Properties.

Logger.LoggerParity = <0 - NoParity> <1 - WithParity> - Determines whether the logger property has been set clearly or not.

Conclusions

Duolabs Srl would like to thank in advance everybody who can offer their ideas for the developement and improvement of this software.

Duolabs would also like to take the occasion to thank all their clients who believe and have faith in them and their products.

Finally, Duolabs would like to take this opportunity to send BIG HUGS ALL AROUND!

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